IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| Appellant: | Hao *et al.* | Examiner: | Channavajjala |
| Serial No.: | 09/847,390 | Group Art Unit: | 2177 |
| Filed: | May 2, 2001 | Docket No.: | 10003407-1 |
| Title: | Method and System for Web-Based Visualization of Directed Association and Frequent Item Sets in Large Volumes of Transaction Data | | |

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Alexandria, VA 22313-1450

**RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF**

Sir:

This paper is submitted in response to the Notification of Non-Compliant Appeal Brief dated March 26, 2007. This is an Appeal Brief submitted pursuant to 37 C.F.R. § 41.37 for the above-referenced patent application.

## I. Real Party in Interest

The real party in interest is Hewlett-Packard Company having a place of business at 1501 Page Mill Road, Palo Alto, CA. The above referenced patent application is assigned to Hewlett-Packard Company.

## II. Related Appeals and Interferences

Appellant is unaware of any related appeals, interferences or judicial proceedings.

## III. Status of Claims

Claims 1-33 are rejected, and claims 22, 23, 28, 29, and 30 have been cancelled Claims 1-21, 24-27, and 30-33 are presented for appeal. The appealed claims are in the attached Appendix of Appealed Claims.

## IV. Status of Amendments

The Amendment and Response After Final Rejection, filed on March 1, 2004, amended claims 1, 21, and 24 to correct typographical errors and place the application in better position for allowance or appeal. The Advisory Action dated September 15, 2004, indicated that the amendment would be entered. An amendment filed April 4, 2007 cancelled claims 22-23 and 28-30 because of incorrect dependencies caused by typographical errors. The cancelled claims do not affect the scope of any other claim under appeal; no Advisory Action has been received in response to the Amendment of April 4, 2007.

## V. Summary of Claimed Subject Matter

In claim 1, one embodiment of Appellant's invention is directed to a method for visualizing transaction data. The method includes receiving transaction data having a plurality of items (e.g., FIG. 4, 110; p. 11, l. 18; FIG. 5, 400; p. 13, l. 22 ). A graph is generated by arranging the items on a spherical surface to specify an initial position of each item (e.g., FIG. 1, 34; FIG. 3, 130; p. 16, l. 2; FIG. 5, 404; p. 14, l. 1). A frequency matrix is constructed for defining a stiffness measure of a spring attached to each pair of items (e.g., FIG. 3, 132; p. 16, l. 21; FIG. 5, 408; p. 14, l. 7). The graph is relaxed, and after relaxation the graph converges to a state of local minimal energy (e.g., FIG. 3, 132; p. 17, l. 1; FIG. 5, 424; p. 14, l. 15; ), with the distance between a pair of items representing the frequency of the items in the transaction data (e.g., p. 12, l. 10; p. 14, l. 18; p. 15, l. 3). A directed edge is employed to represent the association confidence levels and association directions between the items in the transaction data (e.g., FIG. 3, 134; p. 17, l. 25; FIG. 5, 434; p. 14, l. 20; FIG. 6).

In claim 11, in another embodiment, the invention is directed to a system for use in visualizing information. The system comprises a source of transaction data having items (e.g., FIG. 4, 110; p. 11, l. 18; FIG. 5, 400; p. 13, l. 22). A directed association mechanism (FIG. 4, 140; p. 12, l. 6) is coupled to the source of transaction data for receiving transaction data, mapping items and relationships between items to vertices, edges, and positions on a visual spherical surface (FIG. 4, 180; p. 12, l. 10), and for generating and displaying a self-organized graph (FIG. 4, 170, 174; p. 12, l. 23), wherein the distance between each pair of

items represents support, a directed edge represents the direction of the association, and the color of the edge is used to represent the confidence level (FIG. 6; p. 1. 7).

In claim 21, in yet another embodiment, an apparatus is provided for visualizing transaction data. The apparatus comprises means for receiving transaction data having a plurality of items (e.g., FIG. 1, 20; FIG. 4, 140, 180; FIG. 4, 110; p. 11, l. 18; FIG. 5, 400; p. 13, l. 22); means for generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item (e.g., FIG. 1, 20; FIG. 4, 140, 180; FIG. 1, 34; FIG. 3, 130; p. 16, l. 2; FIG. 5, 404; p. 14, l. 1); means for constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items (e.g., FIG. 1, 20; FIG. 4, 140, 180; FIG. 3, 132; p. 16, l. 21; FIG. 5, 408; p. 14, l. 7); means for relaxing the graph (FIG. 1, 20; FIG. 4, 140, 180; FIG. 3, 132; p. 17, l. 1; FIG. 5, 424; p. 14, l. 15); wherein after relaxation the graph converges to a state of local minimal energy, wherein the distance between a pair of items represents the frequency of the items in the transaction data; and means for employing a directed edge to represent the association confidence levels and association directions between the items in the transaction data (e.g., FIG. 1, 20; FIG. 4, 140, 180; FIG. 3, 134; p. 17, l. 25; FIG. 5, 434; p. 14, l. 20; FIG. 6).

In claim 24, an electronically readable medium is configured with instructions (p. 10, l. 10) for causing a processor to perform the steps including, a) receiving transaction data having a plurality of items; b) generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item; c) constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items; d) relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy; wherein the distance between a pair of items represents the frequency of the items in the transaction data; and e) employing a directed edge to represent the association confidence levels and association directions between the items in the transaction data.

## VI. Grounds of Rejection to be Reviewed on Appeal

**A. Claims 1-14, 16, 19-20, 24, 26-27, and 31-33 are rejected under 35 U.S.C. §103(a) over "Gupta" ("Detecting Seasonal Trends and Cluster Motion Visualization for Very High Dimensional Transaction Data", Proceedings of First International SIAM Conference on Data Mining (SDM01), April 1, 2001, pp 1-19) in view of "Agrawal" (U.S. patent number 5,794,209).**

**B. Claims 15, and 17-18 are rejected under 35 U.S.C. §103(a) over the Gupta-Agrawal combination in further view of "Ratnavale" (WO 01/08072A1).**

**C. Claims 1 and 11 are rejected under 35 U.S.C. §103(a) over Gupta in view of "Zaki" ("Evaluation of Sampling for Data Mining of Association Rules", 7th Wkshp.Resrch.Iss.Data Engg, 1996, pp 1-9).**

## VII. Argument

**A. The rejection of claims 1-14, 16, 19-20, 24, 26-27, and 31-33 over Gupta in view of Agrawal is improper.**

The Examiner has failed to satisfy each of the three requirements of a proper Section 103(a) rejection. In order to present a proper Section 103(a) rejection, the Examiner must present a combination of references that teaches or suggests each of the claimed limitations, present evidence of suggestion or motivation to combine the cited references, and have a reasonable expectation of success for the proposed combination (MPEP § 2143). Throughout the prosecution of this application, Appellant has shown that the Examiner has failed to satisfy any of these three criteria; therefore, the Section 103(a) rejection is improper and should be withdrawn.

i. The Cited References Fail to Correspond to the Claimed Invention

a. Claims 1, 11, 21, and 24

The Examiner has failed to identify a combination of references that corresponds to the claimed invention and, more specifically, has failed to present any teachings in the cited references of generating a graph of transaction items by arranging the items on a spherical surface to specify an initial position of each item (claim 1; claims 11, 21, and 24 include

similar limitations in regards to the spherical surface). The Office Actions cite Gupta's page 11, section 5.2, along with Gupta's figures 4a and 4b as teaching these limitations. However, neither Gupta's text nor the figures describe or show either a spherical surface or arranging items on a spherical surface. The Office Actions do not identify any specific elements of Gupta that in any apparent way correspond to these limitations.

In another example, claim 1 includes limitations of and related to constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items, and the Office Action cites Gupta's section 5.2 and page 13, lines 1-14 as teaching these limitations. However, these teachings do not in any apparent way teach the stiffness measure of a spring or using this as attaching pairs of items. The final Office Action attempted to further explain the allegation that Gupta suggests the limitations of "defining a stiffness measure of a spring attached to each pair of items." However, it is respectfully submitted that the Office Actions do not show that Gupta suggests these limitations for at least two reasons. First, Gupta does not deal with item pairs and would have no need of a stiffness measure between pairs. Second, the explanation ignores that it is the "stiffness measure of a spring" that is used, which distinguishes the claim language from the proffered elements of Gupta alleged to suggest "stiffness" by itself.

b. Claims 2, 14, and 25

The Office Actions further fail to show that Agrawal suggests the limitations of and related to generating a confidence matrix for defining the confidence level of each association (claim 2; claims 14 and 25 include similar limitations). Specifically, the Office Action does not show any evidence of a matrix in Agrawal. None of the teachings in Agrwal's col. 4, ll. 15-25 contain any apparent correspondence to a matrix of confidence levels. The cited paragraph reads in full:

> Furthermore, the system includes means for entering at least some of the itemsets in the next forward set of large itemsets, and for determining the number of times selected subsets of the itemsets appear in the database. Means are also provided for outputting an association rule when the ratio of the number of times a selected subset appears in the database to the number of times the associated itemset appears in the database exceeds a predetermined minimum confidence value and thereby satisfies a minimum confidence constraint.

These teachings are clearly not suggestive of the claimed generating of a matrix of confidence levels.

c. Claim 7

The Office Actions fail to show that either Gupta or Agrawal suggests distributing the items equally on a spherical surface by employing a Poisson Disc Sampling (claim 7). It is respectfully submitted that the claims do not recite Poisson Disc Sampling by itself, but rather apply Poisson Disc Sampling to distributing the items on the spherical surface. As explained previously, the Office Action has not made any showing of distributing items on a spherical surface, and therefore, fails to show any suggestion of how the distribution on the spherical surface could be accomplished.

d. Claim 10 and claims 3-6, 8-9, 12-13, 16, 19-20, 26-27, and 31-33

Claim 10 depends from claim 1 and includes limitations of and related to employing color to edges to indicate confidence levels. The Office Actions fail to cite any teaching of Gupta or Agrawal as suggesting these limitations, and these references do not appear to suggest this feature. Absent any showing of a suggestion of these limitations, *prima facie* obviousness cannot be maintained.

Claims 3-6, 8-9, 12-13, 16, 19-20, 26-27, and 31-33 include limitations that further refine the limitations of claims 1, 2, 7, 11, 14, 21, 24, and 25. Thus, the Office Actions do not show that the limitations of these claims are suggested by the Gupta-Agrawal combination.

ii. No Evidence Has Been Provided to Combine the Cited References

The Office Actions do not provide evidence of a motivation for modifying Gupta with the teachings of Agrawal, and therefore, the combination is improper. The Office Action alleges that the combination is obvious because Gupta is directed to visualization schemes for transactional data and Agrawal is directed to discovering association rules in databases, and because the combination "would have allowed uses of Gupta to implement computer program product that selects specific subsets of itemsets and satisfies the minimum

confidence criteria defined by the user, further satisfies rules associated the discovering trends between item set recurrence at least equals user-defined confidence as suggested by Agrawal et al., …, thus improving accuracy and performance of data analysis."

The alleged motivation is improper because it is unsupported by any evidence and is therefore, conclusory. This alleged motivation is merely a broad, conclusory statement of a perceived benefit. The alleged motivation lacks clear and particular reasons that would lead one of ordinary skill in the art to modify specific teachings of Gupta with specific teachings of Agrawal. For example, the Office Action provides no evidence that Gupta is somehow inaccurate or has lesser "performance" than would the combination, nor does the Office Action provide evidence as to the specific elements of Gupta that could be modified by specific elements of Agrawal and made more accurate and have improved performance.

The alleged reasons are also insufficient because the Office Action does not demonstrate that Gupta has any need of directed edges to represent associated confidence levels between items. Furthermore, there is no evidence provided to indicate how the directed edges relate to or would improve the "accuracy and performance of data analysis."

The alleged motivation is improper and therefore, does not support *prima facie* obviousness.

iii. Proposed Combination has no Apparent Reasonable Expectation of Success

The alleged motivation, to the extent it is understood, ignores the fact that Agrawal and Gupta appear to address different problems. Agrawal appears to be directed to discovering associations between types of transactions, e.g., tire purchases and wheel balancing services (col. 6, ll. 30-43), while Gupta appears to be directed to finding seasonal trends of market migration and customer migration from transactional data (p. 2, para. 1). There is no evidence provided to indicate Gupta's detecting seasonal trends would be amenable to modification using Agrawal's mining of product association rules. Thus, the different problem areas addressed by Gupta and Agrawal appear to weigh against a reasonable expectation of successfully combining the generally referenced teachings.

The alleged motivation is merely a broad conclusory statement of a benefit that is speculative, and no evidence has been provided that suggests the combination. The rejection

fails to show that the limitations of the claims are suggested by the combination, fails to provide a proper motivation for making the combination, and fails to show a reasonable expectation of successfully making the combination. Therefore, the Office Actions do not establish a *prima facie* case of obviousness for claims 1-14, 16, 19-20, 24, and 26-33 over Gupta in view of Agrawal.

### B. The rejection of claims 15, and 17-18 over the Gupta and Agrawal in further view of Ratnavale is improper.

The rejection of claims 15 and 17-18 is improper because the Examiner has failed to present a combination of references that teaches or suggests each of the claimed limitations, failed to present evidence of suggestion or motivation to combine the cited references, and failed to present a combination that having a reasonable expectation of success.

#### i. Cited References Fail to Correspond to the Claimed Invention

##### a. Claim 15

Claim 15 includes limitations of and related to the system being utilized to visually associate product affinities and relationships. It is respectfully submitted that none of the cited teachings of Ratnavale (Abstract, FIGs. 4-7) make any reference to these limitations. Specifically, there is no apparent teaching of product affinities, relationships, or visual association. Thus, the Office Actions fail to establish a suggestion of these limitations by the Gupta-Agrawal-Ratnavale combination.

##### b. Claims 17-18

Claims 17 and 18 include limitations of and related to using the claimed system in a telecommunications fraud application and in a network traffic analysis application, respectively. The Office Action cites Ratnavale as teaching these limitations. However, the cited sections do not appear to mention any applications related to telecommunications fraud or applications related to network analysis. Applicants requested an explanation of how the specific elements of Ratnavale relate to the limitations of the claims, but no explanation was provided in the Office Actions. The Office Actions fail to show that the limitations of claims 17 and 18 are suggested by the Gupta-Agrawal-Ratnavale combination because the

combination has no apparent mention of telecommunications fraud or network analysis, and the Office Actions have not explained any perceived correspondence of elements to limitations.

ii. No Evidence Has Been Provided to Combine the Cited References

The alleged motivation for combining Ratnavale with the Gupta-Agrawal combination is improper because no evidence has been provided to suggest the combination. The alleged motivation for combining the teachings of Ratnavale with the Gupta and Agrawal is to "access interactive market system via world wide web or internet based product sales and services of Ratnavale [see Abstract, fig 1], further bringing the advantages of multiple buyers, vendors to customize the market to meet their individual needs in real-time via Internet as suggested by Ratnavale." This alleged motivation merely recites certain objectives of Ratnavale, without explaining how either of Gupta or Agrawal is would benefit from the modification. For example, the Office Action does not explain what need Gupta has for bringing together multiple buyers and vendors in an interactive market system. Furthermore, no such need is apparent because Gupta detects seasonal trends based on past sales, not the bringing together of buyers and sellers in an interactive system.

The alleged motivation is improper because it is unsupported by any evidence and is therefore, conclusory. This alleged motivation is merely a broad, conclusory statement of a perceived benefit. The alleged motivation lacks clear and particular reasons that would lead one of ordinary skill in the art to modify specific teachings of Gupta and Agrawal with specific teachings of Ratnavale.

iii. Proposed Combination has no Apparent Reasonable Expectation of Success

The alleged Gupta-Agrawal-Ratnavale combination has no apparent reasonable expectation of success. As explained above, Gupta detects seasonal trends based on past sales, and Ratnavale describes an approach for bringing together buyers and sellers in an interactive marketplace. Thus, it is not apparent that Gupta, in analyzing trends of past sales, would have any use for Ratnavale's Internet-based interactive marketplace. The different problem areas of Gupta and Ratnavale and the absence of any explanation of any likely

combined elements of Gupta and Ratnavale imply that the asserted Gupta-Agrawal-Ratnavale combination has no apparent reasonable expectation of success.

The rejection fails to show that the limitations of the claims are suggested by the combination, fails to provide a proper motivation for making the combination, and fails to show a reasonable expectation of successfully making the combination. Therefore, the Office Actions do not establish a *prima facie* case of obviousness for claims 15 and 17-18 over Gupta and Agrawal in view of Ratnavale.

### C. The rejection of claims 1 and 11 over Gupta in view of Zaki is improper.

The rejection of claims 1 and 11 is improper because the Examiner has failed to present a combination of references that teaches or suggests each of the claimed limitations and failed to present evidence of suggestion or motivation to combine the cited references.

#### i. Cited References Fail to Correspond to the Claimed Invention

The alleged correspondences of limitations of claims 1 and 11 to teachings of Gupta are mistaken as explained above in the argument under heading **A**. In addition, the Office Actions fails to show that Zaki teaches or suggests the limitations of and related to employing a directed edge to represent the association confidence levels. The cited sections discuss and illustrate the distribution of experimental confidence to the distribution obtained by Chernoff upper bounds. No teaching or suggestion appears relevant to directed edges to represent confidence levels. Nor do the Office Actions explain any perceived correspondence.

The lack of any apparent correspondence of teachings of Zaki to the claim limitations and the absence of any further explanation of the perceived correspondences, as requested, clearly demonstrate that the Office Actions fails to show that the cited references teach all the limitations of claims 1 and 11.

#### ii. No Evidence Has Been Provided to Combine the Cited References

The alleged motivation for combining Zaki with Gupta is improper because it fails to provide evidence to support the motivation. The alleged motivation states that "one of

ordinary skill in the art ... [would have been motivated] to combine the references because that would have allowed uses of Gupta to effectively sampling the various transactional related data, more specifically sampling the item set size and large item sets for stabling accuracy measurements, further establishing confidence levels between various sampling data sets as suggested by Zaki et al., ... , thus improving accuracy and performance data analysis.

This alleged motivation is merely a broad, conclusory statement of a perceived benefit. The alleged motivation lacks clear and particular reasons that would lead one of ordinary skill in the art to modify specific teachings of Gupta with specific teachings of Zaki. For example, there is no evidence provided to support the assertion that Gupta is less accurate than the asserted Gupta-Zaki combination. Nor is any evidence provided to explain what it means for Gupta to be more or less accurate. The alleged motivation is improper because it is unsupported by any evidence and is therefore, conclusory.

The Office Actions have not established a *prima facie* case of obviousness for claims 1 and 11 because the Examiner has failed to present a combination of references that teaches or suggests each of the claimed limitations and has failed to present evidence of suggestion or motivation to combine the cited references.

## VIII. Conclusion

In view of the above, Appellant submits that the rejections are improper, the claimed invention is patentable, and that the rejections of claims 1-21, 24-27, and 31-33 should be reversed. Appellant respectfully requests reversal of the rejections as applied to the appealed claims and allowance of the entire application.

Respectfully submitted,

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## APPENDIX OF APPEALED CLAIMS FOR APPLICATION NO. 09/847,390

1. A method for visualizing transaction data comprising the steps of:

a) receiving transaction data having a plurality of items;

b) generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item;

c) constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items;

d) relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy; wherein the distance between a pair of items represents the frequency of the items in the transaction data; and

e) employing a directed edge to represent the association confidence levels and association directions between the items in the transaction data.

2. The method of claim 1 further comprising the steps of:

f) generating a confidence matrix for defining the confidence level of each association.

3. The method of claim 2 further comprising the steps of:

g) receiving a user-defined minimum confidence level;

h) displaying items having an association with a confidence level that is in a predetermined relationship with the user-defined minimum confidence level.

4. The method of claim 1 wherein the step of receiving a plurality of items comprises the steps of:

a_1) receiving Internet transaction data; wherein the transaction data is described as follows

Transactions {T1, T2, …, Tn}

Products {P1,….Pm}

Transaction Ti = {P1, … , Pmi} i = [1..n]; and

a_2) extracting items from the Internet transaction data.

5. The method of Claim 1 wherein the information includes a plurality of transactions, where each transaction includes one or more items; and wherein the step of generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item includes the step of

b_1) organizing the items based on how frequently the items appear in transactions; and

b_2) specifying the initial position of each item in one of a random fashion and a predetermined fashion.

6. The method of Claim 5 wherein the step of specifying the initial position of each item in one of a random fashion and a predetermined fashion includes the step of distributing the items equally on a spherical surface; wherein tightness is a sum of all supports from a current item to directly adjacent items; and wherein more tightly related items are disposed in the center of the sphere and the less tightly related items are evenly distributed around the center.

7. The method of Claim 6 wherein the step of distributing the items equally on a spherical surface includes distributing the items equally on a spherical surface by employing a Poisson Disc Sampling.

8. The method of claim 1 wherein the frequency matrix includes a plurality of elements, wherein each element includes the frequency of occurrence of the association in all transactions after normalization.

9. The method of claim 1 further comprising the step of:

transforming stiffness of the spring to a distance in a three-dimensional sphere;

wherein the distance between each pair of items represents the support therebetween.

10. The method of claim 1 wherein employing a directed edge to represent the direction of an association between two items further includes the step of:

employing color of the edge to indicate confidence level.

11. A system for use in visualizing information comprising:

a) a source of transaction data having items; and

b) a directed association mechanism coupled to the source of transaction data for receiving transaction data, mapping items and relationships between items to vertices, edges, and positions on a visual spherical surface, and for generating and displaying a self-organized graph, wherein the distance between each pair of items represents support, a directed edge represents the direction of the association, and the color of the edge is used to represent the confidence level.

12. The system of claim 11 wherein the directed association mechanism further comprises:

an initialization component for receiving items and arranging the items into an initial position on a spherical surface to generate a graph;

a relaxation component for constructing a frequency matrix that defines a stiffness measure of a spring attached to each pair of items and for relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy; and

a direction component for determining edge direction and edge color; wherein the support is the frequency of the item set in the transaction data.

13. The system of claim 12 wherein the relaxation component encapsulates a massspring engine for relaxing the graph and enabling the graph to converge to a state of local minimal energy.

14. The system of claim 12 wherein the direction component generates a confidence matrix for defining the direction and confidence level of the association rules.

15. The system of claim 11 wherein the source of transaction data is an electronic commerce web site, the items are products for sale, and the transaction data is transaction data from an electronic commerce application; and

wherein the system is utilized to visually associate product affinities and relationships therebetween.

16. The system of claim 11 wherein the system is utilized in a market basket analysis application.

17. The system of claim 11 wherein the system is utilized in a telecommunications fraud application.

18. The system of claim 11 wherein the system is utilized in a network traffic analysis application.

19. The system of claim 11 wherein the system is utilized in a text mining application.

20. The system of claim 11 wherein the system is utilized in a user profiling application.

21. An apparatus for visualizing transaction data comprising:

means for receiving transaction data having a plurality of items;

means for generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item;

means for constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items;

means for relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy, wherein the distance between a pair of items represents the frequency of the items in the transaction data; and

means for employing a directed edge to represent the association confidence levels and association directions between the items in the transaction data.

24. An article of manufacture, comprising:

an electronically readable medium configured with instructions for causing a processor to perform the steps including,

a) receiving transaction data having a plurality of items;

b) generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item;

c) constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items;

d) relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy; wherein the distance between a pair of items represents the frequency of the items in the transaction data; and

e) employing a directed edge to represent the association confidence levels and association directions between the items in the transaction data.

25. The article of manufacture of claim 24 wherein the electronically readable medium is configured with further instructions for causing a processor to perform the step generating a confidence matrix for defining the confidence level of each association.

26. The article of manufacture of claim 25 wherein the electronically readable medium is configured with further instructions for causing a processor to perform the steps of:

g) receiving a user-defined minimum confidence level;

h) displaying items having an association with a confidence level that is in a predetermined relationship with the user-defined minimum confidence level.

27. The article of manufacture of claim 24 wherein the electronically readable medium is configured with further instructions for causing a processor, in the step of receiving a plurality of items, to perform the steps comprising:

a_1) receiving Internet transaction data; wherein the transaction data is described as follows

Transactions {T1, T2, …, Tn}

Products {P1,….Pm}

Transaction Ti = {P1, … , Pmi} i = [1..n]; and

a_2) extracting items from the Internet transaction data.

31. The article of manufacture of claim 24 wherein the frequency matrix includes a plurality of elements, wherein each element includes the frequency of occurrence of the association in all transactions after normalization.

32. The article of manufacture of claim 24, wherein the electronically readable medium is configured with further instructions for causing a processor to perform the step comprising transforming stiffness of the spring to a distance in a three-dimensional sphere; wherein the distance between each pair of items represents the support therebetween.

33. The article of manufacture of claim 24, wherein the electronically readable medium is configured with further instructions for causing a processor, in performing the step of employing a directed edge to represent the direction of an association between two items, the perform the step of employing color of the edge to indicate confidence level.

**APPENDIX OF EVIDENCE FOR**

**APPLICATION NO. 09/847,390**

Appellant is unaware of any evidence submitted in this application pursuant to 37 C.F.R. §§ 1.130, 1.131, and 1.132.

## APPENDIX OF RELATED PROCEEDINGS FOR APPLICATION NO. 09/847,390

As stated in Section II above, Appellant is unaware of any related appeals, interferences or judicial proceedings.